

Amendments to the Claims

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of Claims:

1. (CURRENTLY AMENDED) A display device driving circuit which includes a scanning signal line driving section for outputting display scanning signals respectively to scanning signal lines for displaying an image according to the display data with respect to pixels which are disposed in a matrix and a control section including a set section in which is set each of an image display area and one or more non-image areas and which control section outputs a transition instruction signal for each of the one or more non-image areas,

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said display device driving circuit comprising:

control means for switching, from successive output to simultaneous output, the output of the display scanning signals to the respective scanning signal lines based on a the transition instruction signal so as to cause a that causes the transition from successive output to simultaneous output, and controlling the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines based on the received transition instruction signal, so that the display scanning signals are outputted simultaneously with respect to all scanning signal lines until receipt of an instructional signal of a start of a next successive output is started by an instruction signal for successively outputting the display scanning signals.

2. (ORIGINAL) The display device driving circuit as set forth in claim 1, wherein said scanning signal line driving section includes a plurality of serially connected shift register sections for outputting the display scanning signals with respect to the respective scanning signal lines.

3. (ORIGINAL) The display device driving circuit as set forth in claim 1, comprising deactivating means for deactivating an operation of the scanning signal line driving section based on a synchronize signal and the transition instruction signal for displaying the image.

4. (ORIGINAL) The display device driving circuit as set forth in claim 1, wherein said control means includes an unscanned area recognizing section for recognizing an unscanned area based on the transition instruction signal, and controls the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines so that the display scanning signals are outputted only to those scanning signal lines which correspond to the unscanned area as recognized by the unscanned area recognizing section.

5. (CURRENTLY AMENDED) The display device driving circuit as set forth in claim 2, wherein said scanning signal line driving section has a plurality of scanning starting positions which are set in a vertical direction, and successively outputs, among the plurality of scanning starting positions, the display scanning signals to scanning signal lines which correspond to a one of the one or more non-image areas, which is an area from a scanning starting position therein in the vicinity of a front portion of an the image display area to the image display area, and to scanning signal lines

which correspond to the image display area, and thereafter simultaneously outputs the display scanning signals to scanning signal lines which correspond to an unscanned area based on the transition instruction signal.

6. (ORIGINAL) The display device driving circuit as set forth in claim 5, wherein said scanning signal line driving section deactivates an operation of a display device, after simultaneously outputting the display scanning signals only to the scanning signal lines which correspond to the unscanned area and until next successive output is carried out.

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7. (CURRENTLY AMENDED) The display device driving circuit as set forth in claim 1, wherein said control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are simultaneously outputted within one horizontal period to scanning signal lines of ~~a the one or more~~ non-image areas.

8. (CURRENTLY AMENDED) The display device driving circuit as set forth in claim 1, wherein said control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are simultaneously outputted within two horizontal periods to scanning signal lines of ~~a the one or more~~ non-image areas.

9. (CURRENTLY AMENDED) A display device driving circuit which includes a scanning signal line driving section for outputting display scanning signals respectively to scanning

signal lines for displaying an image according to the display data with respect to pixels which are disposed in a matrix and a control section including a set section in which is set each of an image display area and one or more non-image areas and which control section outputs a transition instruction signal for each of the one or more non-image areas,

said display device driving circuit comprising:

input means for receiving ~~a~~ the transition instruction signal for causing a transition from successive output to simultaneous output with respect to the output of the display scanning signals to the respective scanning signal lines; and

control means for switching, from successive output to simultaneous output, the output of the display scanning signals to the respective scanning signal lines based on ~~a~~ the received transition instruction signal so as to cause a that causes the transition from successive output to simultaneous output, and controlling the scanning signal line driving section based on the received transition instruction signal so that the display scanning signals are outputted simultaneously with respect to all scanning signal lines until receipt of an instructional signal of a start of a next successive output is started by an instruction signal for successively outputting the display scanning signals.

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10. (ORIGINAL) The display device driving circuit as set forth in claim 9, wherein said scanning signal line driving section includes a plurality of serially connected shift register sections for outputting the display scanning signals with respect to the respective scanning signal lines.

11. (ORIGINAL) The display device driving circuit as set forth in claim 9, wherein said control means includes deactivating means for deactivating an operation of the scanning signal line driving section based on a synchronize signal and the transition instruction signal for displaying the image.

12. (ORIGINAL) The display device driving circuit as set forth in claim 9, wherein said control means includes an unscanned area recognizing section for recognizing an unscanned area based on the transition instruction signal, and controls the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines so that the display scanning signals are outputted only to those scanning signal lines which correspond to the unscanned area as recognized by the unscanned area recognizing section.

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13. (CURRENTLY AMENDED) The display device driving circuit as set forth in claim 10, wherein said scanning signal line driving section has a plurality of scanning starting positions which are set in a vertical direction, and successively outputs, among the plurality of scanning starting positions, the display scanning signals to scanning signal lines which correspond to ~~a one of the one or more~~ non-image areas, which is an area from a scanning starting position therein in the vicinity of a front portion of ~~an~~ the image display area to the image display area, and to scanning signal lines which correspond to the image display area, and thereafter simultaneously outputs the display scanning signals to scanning signal lines which correspond to an unscanned area based on the transition instruction signal.

14. (ORIGINAL) The display device driving circuit as set forth in claim 13, wherein said scanning signal line driving section deactivates an operation of a display device, after simultaneously outputting the display scanning signals only to the scanning signal lines which correspond to the unscanned area and until next successive output is carried out.

15. (CURRENTLY AMENDED) The display device driving circuit as set forth in claim 9, wherein said control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are simultaneously outputted within one horizontal period to scanning signal lines of ~~a~~ the one or more non-image areas.

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16. (CURRENTLY AMENDED) The display device driving circuit as set forth in claim 9, wherein said control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are simultaneously outputted within two horizontal periods to scanning signal lines of ~~a~~ the one or more non-image areas.

17. (CURRENTLY AMENDED) A driving method of a display device which outputs display scanning signals respectively to scanning signal lines, and outputs display data signals respectively to data signal lines, so as to display an image which is in accordance with the display data with respect to pixels which are disposed in a matrix, and has a partial display function for a

one or more non-image areas and an image display area, said driving method comprising the step of:

_____ outputting a transitional instructional signal for each of the one or more non-image areas and not outputting the transitional instructional signal for the image display area; and simultaneously outputting the display scanning signals with respect to the plurality of scanning signal lines based on ~~a~~the transition instruction signal so as to cause that causes a transition from successive output to simultaneous output, so that the display scanning signals are outputted simultaneously with respect to all scanning signal lines for the one or more non-image areas until receipt of an instructional signal of a start of a next successive output is started by an instruction signal for successively outputting the display scanning signals.

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18. (ORIGINAL) The method as set forth in claim 17, wherein an operation of a display device is deactivated, after simultaneously outputting the display scanning signals only to the scanning signal lines which correspond to the unscanned area based on the transition instruction signal and until next successive output is carried out.

19. (CURRENTLY AMENDED) The method as set forth in claim 17, wherein, among a plurality of scanning starting positions which are set in a vertical direction, the display scanning signals are successively outputted to scanning signal lines which correspond to ~~a~~one of the one or more non-image areas, which is an area from a scanning starting position therein in the vicinity of a front portion of ~~an~~the image display area to the image display area, and to scanning signal lines

which correspond to the image display area, and thereafter the display scanning signals are simultaneously outputted to scanning signal lines which correspond to an unscanned area based on the transition instruction signal.

20. (ORIGINAL) The method as set forth in claim 17, wherein the display scanning signals are simultaneously outputted based on the transition instruction signal to each of a first line group and a second line group of the scanning signal lines which correspond to an unscanned area.

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21. (ORIGINAL) The method as set forth in claim 17, wherein frequencies of the display scanning signals are different between successive output and simultaneous output of the display scanning signals with respect to the scanning signal lines.

22. (CURRENTLY AMENDED) The method as set forth in claim 17, wherein display scanning signals according to the one or more non-image areas are simultaneously outputted within one horizontal period with respect to scanning signal lines which correspond to the one or more non-image areas.

23. (CURRENTLY AMENDED) The method as set forth in claim 17, wherein display scanning signals according to the one or more non-image areas are simultaneously outputted within two horizontal periods with respect to scanning signal lines which correspond to the one or more non-image areas.

24. (CURRENTLY AMENDED) A driving method of a display device which outputs display scanning signals respectively to scanning signal lines, and outputs display data signals respectively to data signal lines, so as to display an image which is in accordance with the display data with respect to pixels which are disposed in a matrix, and has a partial display function for a non-image area and an image display area,

said method comprising the steps of:

distinguishing a predetermined image display area portion and a predetermined non-display portion non-image area from each other;

simultaneously outputting the display scanning signals and the display data signals according to the non-image area with respect to the respective scanning signal lines and the respective data signal lines which correspond to the non-image area; and

following said simultaneously outputting, deactivating operation of the scanning signal line driving section until next display is carried out.

25. (ORIGINAL) The method as set forth in claim 24, wherein display scanning signals according to the non-image area are simultaneously outputted within one horizontal period with respect to scanning signal lines which correspond to the non-image area.

26. (ORIGINAL) The method as set forth in claim 24, wherein display scanning signals according to the non-image area are simultaneously outputted within two horizontal periods with respect to scanning signal lines which correspond to the non-image area.

27. (CURRENTLY AMENDED) An image display device which includes a scanning signal line driving section for outputting display scanning signals respectively to scanning signal lines, a data signal line driving section for outputting display data signals respectively to data signal lines, so as to display an image according to the display data with respect to pixels which are disposed in a matrix, said pixels having a partial display function for an image display area and a non-image area,

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said image display device comprising:

means for distinguishing the image display area and the non-image area from each other and for outputting a transition instructional signal for the non-image area; and

scanning signal line control means for switching, from successive output to simultaneous output, the output of the display scanning signals to the respective scanning signal lines based on a the transition instruction signal so as to cause a that causes the transition from successive output to simultaneous output, and controlling the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines based on the received transition instruction signal, so that the display scanning signals are outputted simultaneously with respect to all scanning signal lines for the non-image area until receipt of an instructional signal of a start of a

next successive output is started by an instruction signal for successively outputting the display scanning signals.

28. (CURRENTLY AMENDED) The image display device as set forth in claim 27, wherein said scanning signal line driving section includes a plurality of serially connected shift register sections for outputting the display scanning signals to the respective scanning signal lines and includes a plurality of scanning starting positions which are set in a vertical direction, said scanning signal line driving section successively outputting, among the plurality of scanning starting positions, the display scanning signals to scanning signal lines which correspond to ~~at the~~ non-image area, which is an area from a scanning starting position therein in the vicinity of a front portion of ~~at the~~ image display area to the image display area, and to scanning signal lines which correspond to the image display area, and thereafter simultaneously outputting, based on the transition instruction signal, the display scanning signals to scanning signal lines which correspond to an unscanned area.

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29. (ORIGINAL) The image display device as set forth in claim 27, wherein said scanning signal line control means controls the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines so that an operation of the image display device is deactivated after simultaneously outputting the display scanning signals only to the scanning signal lines which correspond to the unscanned area based on the transition instruction signal and until next successive output is carried out.

30. (ORIGINAL) The image display device as set forth in claim 27, wherein said scanning signal line control means controls the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines based on the transition instruction signal so that the display scanning signals are simultaneously outputted to each of a first line group and a second line group which correspond to an unscanned area.

31. (ORIGINAL) The image display device as set forth in claim 27, wherein said scanning signal line control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are outputted simultaneously within one horizontal period with respect to scanning signal lines of the non-image area.

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32. (ORIGINAL) The image display device as set forth in claim 27, wherein said scanning signal line control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are outputted simultaneously within two horizontal periods with respect to scanning signal lines of the non-image area.

33. (CURRENTLY AMENDED) An image display device which includes a scanning signal line driving section for outputting display scanning signals respectively to scanning signal lines, a data signal line driving section for outputting display data signals respectively to data signal lines, and a set section for setting an image display area according to the display data and a non-

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U.S.S.N. 09/815,257
2nd Preliminary Amendment
Page 14

display non-image area with respect to pixels, so as to display an image according to the display data with respect to the pixels which are disposed in a matrix,

said image display device comprising:

scanning signal line control means for controlling the scanning signal line driving section so that the display scanning signals are simultaneously outputted with respect to the respective scanning signal lines which correspond to the non-image area as set by the set section,

the scanning signal line driving section including a plurality of serially connected shift register sections for outputting the display scanning signals respectively to the scanning signal lines,

the scanning signal line control means individually and simultaneously scanning the shift register sections in the non-image area, and

wherein to the serially connected shift registers, respective start pulse signals are supplied and being signaled by the start pulse singlas, scanning of the scanning signal lines is started.

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34. (ORIGINAL) The image display device as set forth in claim 33, comprising data signal line control means for controlling the data signal line driving section so as to output the display data signals for the non-image area to the respective data signal lines when the display scanning signals are simultaneously outputted.

35. (ORIGINAL) The image display device as set forth in claim 33, comprising first deactivating means for deactivating an operation of the data signal line driving section after the

simultaneous output and until next successive output with respect to a horizontal period based on the display data.

36. (ORIGINAL) The image display device as set forth in claim 33, comprising second deactivating means for deactivating an operation of the scanning signal line driving section after the simultaneous output and until next successive output with respect to a horizontal period based on the display data.

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37. (ORIGINAL) The image display device as set forth in claim 33, wherein a first clock signal for displaying the image display area and a second clock signal for displaying the non-image area are different from each other.

38. (ORIGINAL) The image display device as set forth in claim 33, wherein said scanning signal line control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are outputted simultaneously within one horizontal period with respect to the scanning signal lines of the non-image area.

39. (ORIGINAL) The image display device as set forth in claim 33, wherein said scanning signal line control means controls the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are outputted simultaneously within two horizontal periods with respect to the scanning signal lines of the non-image area.

40. (PREVIOUSLY ADDED) The method as set forth in claim 17, wherein the display scanning signals are outputted based on the transition instruction signal simultaneously to an odd-numbered line group of the scanning signal lines that correspond to an unscanned area and simultaneously to an even-numbered line group of the scanning signal lines that correspond to the unscanned area.

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41. (PREVIOUSLY ADDED) The method as set forth in claim 17, wherein the display scanning signals are outputted based on the transition instruction signal simultaneously to odd-numbered pairs of adjacent ones of the scanning signal lines that correspond to an unscanned area and simultaneously to even-numbered pairs of adjacent ones of the scanning signal lines that correspond to the unscanned area.

42. (CURRENTLY AMENDED) A display device driving circuit which includes a scanning signal line driving section for outputting display scanning signals respectively to scanning signal lines for displaying an image according to the display data with respect to pixels which are disposed in a matrix, said display device driving circuit comprising:

means for distinguishing an image display area and a non-image area from each other and for outputting a transition instructional signal for the non-image area;

deactivating means for deactivating operation of the scanning signal line driving section based on a synchronize signal for image display and based on ~~a~~the transition instruction signal; and

control means for switching, from successive output to simultaneous output, the output of the display scanning signals to the respective scanning signal lines based on ~~a~~ the transition instruction signal ~~so as to cause a~~ for causing the transition from successive output to simultaneous output, and controlling the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines based on the received transition instruction signal, so that the display scanning signals are outputted simultaneously within one horizontal period or two horizontal periods with respect to all scanning signal lines until next scanning is started.

D) 43. (PREVIOUSLY AMENDED) A driving method of a display device which outputs display scanning signals respectively to scanning signal lines, and outputs display data signals respectively to data signal lines, so as to display an image which is in accordance with the display data with respect to pixels which are disposed in a matrix, the display device having a partial display function for a non-image area and an image display area, horizontal signal lines in a vertical period of the display device being greater in number than the scanning signal lines, said method comprising the step of:

simultaneously outputting the display scanning signals and the display data signals according to the non-image area with respect to the respective scanning signal lines and the respective data signal lines that correspond to the non-image area; and
wherein the number of horizontal signal lines in a vertical period shall be understood to correspond to the number of scanning signal lines of input video signals.

44. (CURRENTLY ADDED) A display device driving circuit for a display that is divided into an image display area in which full image display function is allowed and one or more non-image areas having a partial image display function; said display device driving circuit comprising:

a scanning signal line driving section for outputting display scanning signals respectively to scanning signal lines for displaying an image according to the display data with respect to pixels which are disposed in a matrix;

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output control circuitry that is configured and arranged so as to distinguish between the image display area and the one or more non-image areas, where an external transition signal is inputted to the control circuitry so as to identify each of the one or more non-display areas and so as to switch the output of the display scanning signals from the scanning line driving section to the respective scanning signal lines between one of a successive output mode and a simultaneous output mode responsive to such distinguishing;

wherein the output control circuitry is configured and arranged so the output of the display scanning signals from the scanning line driving section to the respective scanning signal lines is in the simultaneous output mode, responsive to the receipt of the transition instruction signal, and so as to control the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines so that the display scanning signals are outputted simultaneously with respect to all scanning signal lines; and

wherein the output control circuitry is configured and arranged so the output of the display scanning signals from the scanning line driving section to the respective scanning signal lines is in

the successive output mode when the output control circuitry distinguishes the display area and so as to control the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines so that the display scanning signals are successively outputted to the respective scanning signal lines.

45. (CURRENTLY ADDED) The display device driving circuit of claim 44, wherein the output control circuitry includes an un-scanned area recognizing section that is configured and arranged so as to recognizing that an area that has not been scanned responsive to the external transitional instruction signal, and

wherein the output control circuitry is configured and arranged so the output of the display scanning signals from the scanning line driving section to the respective scanning signal lines is in the simultaneous output mode, responsive to the receipt of the transition instruction signal, and so as to control the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines so that the display scanning signals are outputted simultaneously only to those scanning signal lines which correspond to the unscanned area as recognized by the unscanned area recognizing section.

46. (CURRENTLY ADDED) The display device driving circuit of claim 44, wherein the output control circuitry includes an input section and a scanning area judging section; wherein the input section is configured and arranged so as to generate a first pulse signal responsive to the received transitional instruction signal;

wherein the judging section is configured and arranged so as to judge an area to be one of the one or more non-image areas when a first pulse signal is received from the input section and to judge the area to be the image display area when there is no first pulse signal.

47. (CURRENTLY ADDED) The display device driving circuit as set forth in claim 46, wherein said scanning signal line driving section includes a plurality of serially connected shift register sections for outputting second pulse signals therefrom to the judging section; and wherein the judging section is configured and arranged so as to judge the area to be the image display area when second pulse signals are received and there is no first pulse signal.

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48. (CURRENTLY ADDED) The display device driving circuit as set forth in claim 47, wherein the judging section includes a plurality of logic elements one for each of the plurality of shift register sections and each of the plurality of logic elements are arranged so as to be operably coupled to a respective one of the plurality of shift register sections and to the input section.

49. (CURRENTLY ADDED) The display device driving circuit as set forth in claim 47, wherein said scanning signal line driving section further includes a level shifter and wherein said judging section is operably coupled between the level shifter and each of the shift register sections and the input section.

50. (CURRENTLY ADDED) The display device driving circuit as set forth in claim 49, wherein the judging section includes a plurality of logic elements one for each of the plurality of shift register sections and each of the plurality of logic elements are arranged so as to be operably coupled to a respective one of the plurality of shift register sections, to the input section and to the level shifter.

51. (CURRENTLY ADDED) The display device driving circuit as set forth in claim 47, wherein said scanning signal line driving section has a plurality of scanning starting positions which are set in a vertical direction, and successively outputs, among the plurality of scanning starting positions, the display scanning signals to scanning signal lines which correspond to one of the one or more non-image areas, which is an area from a scanning starting position therein in the vicinity of a front portion of the image display area to the image display area, and to scanning signal lines which correspond to the image display area, and thereafter simultaneously outputs the display scanning signals to scanning signal lines which correspond to an unscanned area based on the transition instruction signal.

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52. (CURRENTLY ADDED) The display device driving circuit as set forth in claim 44, wherein said output control circuitry is configured and arranged so as to control the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are simultaneously outputted within one horizontal period to scanning signal lines of the one or more non-image areas.

53. (CURRENTLY ADDED) The display device driving circuit as set forth in claim 44, wherein said output control circuitry is configured and arranged so as to control the scanning signal line driving section based on the transition instruction signal so that the display scanning signals are simultaneously outputted within two horizontal periods to scanning signal lines of the one or more non-image areas.

54. (CURRENTLY ADDED) An image display device comprising:
a scanning signal line driving section for outputting display scanning signals respectively to scanning signal lines,
a data signal line driving section for outputting display data signals respectively to data signal lines,

a set section for setting an image display area according to the display data and one or more non-image areas with respect to pixels, so as to display an image according to the display data with respect to the pixels which are disposed in a matrix,

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output control circuitry that is configured and arranged so as to distinguish between the image display area and the one or more non-image areas, where an external transition signal is inputted to the control circuitry so as to identify each of the one or more non-display areas as set in the setting section and so as to switch the output of the display scanning signals from the scanning line driving section to the respective scanning signal lines between one of a successive output mode and a simultaneous output mode responsive to such distinguishing;

wherein the output control circuitry is configured and arranged so the output of the display scanning signals from the scanning line driving section to the respective scanning signal lines is in the simultaneous output mode, responsive to the receipt of the transition instruction signal, and so as to control the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines so that the display scanning signals are outputted simultaneously with respect to all scanning signal lines; and

wherein the output control circuitry is configured and arranged so the output of the display scanning signals from the scanning line driving section to the respective scanning signal lines is in the successive output mode when the output control circuitry distinguishes the display area and so as to control the output of the display scanning signals from the scanning signal line driving section to the respective scanning signal lines so that the display scanning signals are successively outputted to the respective scanning signal lines.

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55. (CURRENTLY ADDED) The display device of claim 54, wherein:

the output control circuitry includes an input section and a scanning area judging section, where the input section is configured and arranged so as to generate a first pulse signal responsive to the received transitional instruction signal;

said scanning signal line driving section includes a plurality of serially connected shift register sections for outputting second pulse signals therefrom to the judging section; and

the judging section is configured and arranged so as to judge an area to be one of the one or more non-image areas when a first pulse signal is received from the input section and to judge the

area to be the image display area when there is no first pulse signal and second pulse signals are being received.

56. (CURRENTLY ADDED) The display device as set forth in claim 55, wherein the judging section includes a plurality of logic elements one for each of the plurality of shift register sections and each of the plurality of logic elements are arranged so as to be operably coupled to a respective one of the plurality of shift register sections and to the input section.

57. (CURRENTLY ADDED) The display device as set forth in claim 55, wherein said scanning signal line driving section further includes a level shifter and wherein said judging section is operably coupled between the level shifter and each of the shift register sections and the input section.

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58. (CURRENTLY ADDED) The display device driving circuit as set forth in claim 57, wherein the judging section includes a plurality of logic elements one for each of the plurality of shift register sections and each of the plurality of logic elements are arranged so as to be operably coupled to a respective one of the plurality of shift register sections, to the input section and to the level shifter.
